Appendix 7
Closure Plan

ATTACHMENT VII

CLOSURE PLAN AND PROCEDURES

CLOSURE AND POST CLOSURE

SECTION G

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SECTION G
CLOSURE AND POST-CLOSURE

G-1. INTRODUCTION

The U.S. Environmental Protection Agency **[EPA]** has promulgated regulations pursuant to RCRA which require owners and operators of hazardous waste management facilities to prepare and maintain written closure and post-closure plans. Similar requirements have been established by the Massachusetts Department of Environmental Protection **[DEP]** in 310 CMR 30.580-.596. Consistent with these requirements Laidlaw Environmental Services (North East), Inc. **[LES]** maintains a copy of this facility Closure Plan **[Plan]** on-site until closure has been completed and certified by an independent, registered professional engineer. Post-closure requirements do not apply to the LES facility as discussed in Section G-4. In accordance with applicable regulations and requirements, this document also includes a written estimate of current closure costs. The closure estimate will be revised annually to account for inflation and as necessary to reflect a change in the Plan which would increase the cost of closure in accordance with 310 CMR 30.903.

The purpose of the Plan is to identify and describe all procedures that LES will employ to close the facility at the end of or at any time during its intended operating life. The goal of the Plan is to achieve complete waste removal and decontamination to the extent that post-closure use of the property would not be limited by the previous use of the property by LES. During closure, LES will be responsible for the generation of any waste. In addition, any waste generated will be managed in accordance with 310 CMR 30.000.

Copies of the Plan are maintained at the LES Administrative Office in North Andover, Massachusetts. Copies are kept on file at the DEP's North East Regional Office in Wilmington.

G-2. CLOSURE PERFORMANCE STANDARD

In the event of closure, the LES facility will be decommissioned in a manner that minimizes or eliminates the need for further maintenance. Closure activities are specifically designed to protect public health, safety, welfare, and the environment. Safety and contingency procedures will be implemented during closure activities.

Since all wastes and waste residues are removed during closure, post-closure care is not applicable to the LES facility. The Plan is specifically designed to prevent the possibility of post-closure escape of hazardous waste, hazardous waste constituents, leachate, contaminated run-off, and waste decomposition products to ground water, surface water, soil, or the atmosphere. Following closure the facility will be inspected by a Massachusetts Licensed Professional Engineer **[PE]** and samples will be taken in the building and analyzed to assure that no contamination remains after the facility is closed. The PE will certify closure.

The LES facility has been designed and is operated in a manner that is intended to minimize the potential for contamination of the facility structures, equipment or surrounding property. All storage areas are located inside the building and the building is perimeter-diked to contain greater than 10% of any potential spill. There are also separate designated walled or diked storage areas within the perimeter dike for ignitable, alkaline, acid, and oxidizing wastes. The truck loading area is also equipped with containment and is capable of holding in excess of 200% of a potential spill (two times two truck loads).

Facility design features which ensure spill containment are discussed in Section E, Contingency Plan and Procedures. The LES facility design, coupled with frequent inspection, proper facility maintenance, and effective personnel training provides safe daily operation and minimizes the need for clean-up and decontamination at closure. Inspection and training programs are detailed in Sections E, Contingency Plan and Procedures and Section F, Facility Training Plan.

G-3 PARTIAL CLOSURE

The LES facility does not maintain any units or operations to which partial closure would apply. All storage is provided in one building for which phased or partial closure would be inappropriate. At this time, partial closure is ***not applicable***. The facility and type of operation is such that only complete closure applies. Should a modification to the facility, equipment, structures, or procedures related to the facility operation be made that would make partial closure applicable, the Plan would be revised accordingly.

G-4 POST CLOSURE

Post closure care requirements of 310 CMR 30.593 apply to facilities at which hazardous waste or waste residues will remain after closure. LES is not a disposal facility, nor will waste or contaminated materials remain after closure. Due to the nature of the LES facility and type of operation, a post closure plan is ***not applicable***. The Closure Plan is designed to ensure that all wastes and residues are removed and that post closure care is unnecessary.

G-5 DATE OF CLOSURE

In accordance with 310 CMR 30.583(1), facilities not using trust funds are not required to estimate the expected year of closure, provided that the closure fund mechanism is funded appropriately and updated annually. Because LES uses a surety bond guaranteeing performance of closure for the funding of closure costs, and updates this bond annually, the requirement of a facility estimated year of closure is not applicable.

G-6 CLOSURE SCHEDULE

The DEP will be notified at least six months before the date that closure is expected to begin. At that time, LES will submit a copy of the updated Plan to the DEP. The LES closure schedule is provided in Figure G-1. Closure will begin within thirty (30) days of final receipt of waste. Consistent with state and federal closure requirements, all waste will have been removed to off-site reclamation,

treatment or disposal within 90 days after receiving the final volume of waste.

Complete closure will be accomplished within 180 days from the receipt of the last waste shipment (310 CMR 30.584(2)). LES will maintain a copy of the approved Plan (and any revisions) on-site until certification of closure completeness has been submitted and accepted by EPA or DEP.

Upon completion of closure, LES will submit to the EPA Regional Administrator and Director of the DEP, a certification signed by the owner and signed and stamped by an independent, Professional Engineer registered in the Commonwealth of Massachusetts, that the facility has been closed in accordance with all pertinent regulations and the procedures outlined in the Plan.

G-7 MAXIMUM WASTE INVENTORY

While the anticipated inventory of containerized waste is expected to be much less, this Plan is based on an inventory of 3,636 55-gallon equivalent containers of waste. The estimate of 3,636 containers or 200,000 gallons reflects the licensed storage capacity and is therefore equal to the maximum waste inventory.

If the present storage capability were to change, a license modification would be necessary and the subsequent amended Plan would be forwarded to the DEP. Table G-1 provides a breakdown of the maximum waste inventory by specific waste type. Estimates of waste volumes for specific waste types are based on a typical cross-section of LES clients. Table G-1 and associated cost estimates for reclamation, treatment or disposal will be revised whenever a significant change in market conditions becomes apparent or at the anniversary date.

G-8 REMOVAL AND DISPOSAL OF DECONTAMINATED EQUIPMENT

G-8.1 Decontamination Equipment

All equipment such as brushes, brooms, squeegees, mops, cleaning wipes and shovels used in the decontamination of the facility will be directly disposed of in accordance with the facility Waste Analysis Plan **[WAP]**, or where possible, decontaminated.

Decontamination would be accomplished by removing all contaminants by spraying, washing, and scrubbing all protective equipment with a detergent solution. The resultant wash residue will then be evaluated and disposed of in accordance with the facility WAP.

G-8.2 Protective Equipment

All protective equipment such as gloves, boots, coveralls, hard hats, face shields, and cartridge respirators, which are standard safety equipment used in the facility, will be directly disposed of in accordance with the facility WAP, or where possible, decontaminated.

Decontamination would be accomplished by removing all contaminants by spraying, washing, and scrubbing all protective equipment with a detergent solution. The resultant wash residue will then be evaluated and disposed of in accordance with the facility WAP.

Self contained breathing apparatus **[SCBA]**, extra SCBA tanks, fire extinguishers, first aid kits and telephones will also be washed and scrubbed with a detergent solution. Again, this wash residue will then be evaluated and disposed of in accordance with the facility WAP.

G-8.3 Absorbent Material

The remaining contents of any opened bags of absorbent kept for potential spills will be evaluated and disposed of in accordance with WAP. Any closed uncontaminated bags of absorbent will be sold.

G-8.4 Empty Containers

All unused new or reconditioned empty containers will be sold to a container reconditioning facility. As all unused containers are kept sealed, only the outside of the container will require decontamination. Decontamination will be accomplished by wiping with damp, detergent-soaked wipes. Wipes and resultant wash residue wash residue will then be evaluated and disposed of in accordance with the facility WAP.

G-8.5 Container Handling Equipment

Container handling equipment such as the compactor unit, container jacks and forklifts will be washed and scrubbed with a detergent cleaning solution to remove all residuals of oil and grease. Container handling equipment will also be steam cleaned to remove any residual dirt, oil and grease.

G-8.6 Pumping Equipment

All pumps that had been used in the facility or kept in the facility for emergency purposes will be first flushed and scrubbed with clean virgin solvents and then will be detergent rinsed. LES currently maintains one electric and several barrel pumps. Solvents will be chosen depending upon the type and degree of cleaning needed. Waste solvent and detergent solutions generated by decontamination will be disposed of as hazardous waste by aqueous treatment. If desired cleaning cannot be achieved, pumps will be disposed of by landfilling as a hazardous waste in accordance with the LES process description and WAP.

G-8.7 Steel Tank

A 2,000 gallon steel above ground tank is maintained in the container storage area for spill response. While this tank is free of contaminants, it will be cleaned during closure as if contamination were present. The following procedure will be used to decontaminate the tank:

a. Manhole cover removed and any sludge removed either by vacuum truck or manually by shovel.

b. Tank re-closed and steam cleaned making sure sufficient steam is used to raise the shell temperature so as to ensure proper cleaning and removal of any and all residue.

c. Tank will be purged and water flushed. Water will be disposed of as if a hazardous waste by aqueous treatment. A volatile organic vapor detector will be used to determine if any hazardous vapor remains and a visual inspection for waste residue will be conducted. If the tank is not clean, the previous steps will be repeated until the intended results are achieved.

d. A PE will certify that the tank is clean. The tank will be sold for salvage or given to a used tank broker. LES feels that this is a proper method of removal as the tank is not used to contain waste except in the event of an emergency such as a spill. Since the tank is kept indoors, isolated from adverse weather conditions, significant degradation of structural integrity is unlikely.

G-8.8 Decontamination of Compactor

The compaction unit will be decontaminated in accordance with the Plan. Decontamination will be accomplished by removing all contaminants by spraying, washing, and scrubbing the unit with a detergent solution. The resultant wash residue will then be evaluated and disposed of in accordance with the facility WAP. The compaction unit will be sold once decontamination is completed.

G-9 CLOSURE OF CONTAINER STORAGE AREA

During the active life of the facility, containers of waste are brought in, identified and verified according to the facility WAP, and categorized into various waste types for eventual shipment to off-site treatment, disposal, or reclamation facilities. Closure of the container storage and waste handling areas are designed to meet the requirements of 310 CMR 30.689(1) and will include the following procedures:

1. After final receipt of waste, all containers will be analyzed, identified, and categorized according to the WAP. A complete inventory will be taken.

2. Container disposal will be by the same method used prior to closure (*see Section C, Waste Analysis Plan*). All containers of waste will be either pumped and bulked into tank trucks, or loaded onto box trailers and taken to approved off-site reclamation, treatment or disposal facilities.

3. All empty containers that contain waste residue will be removed and transported off-site to an approved recycling or disposal facility.

4. A Sampling Plan will be developed based on historical uses of each area of the facility. The Sampling Plan will be utilized for the pre-characterization of waste for disposal (prior to the WAP), determine the extent of surface contamination, and verify appropriate decontamination procedures. From the Sampling Plan, a Work Plan will be developed in which various cleaning techniques will be evaluated to provide optimal efficiency in the facility closure process.

5. All containers and container handling areas will be cleaned of debris using brooms, sweeping compound and shovels. Any debris that is picked up in this manner will be placed a proper Department of Transportation **[DOT]** or United Nations **[UN]** chemically compatible container for disposal in accordance with the facility WAP.

6. All container storage and handling areas (including the loading dock and loading bay) will be cleaned by flushing with water followed by a series of high-pressure steam washes. The resultant wash residue will then be evaluated and disposed of in accordance with the facility WAP.

7. All floors, walls, dike walls, support posts and beams will be high pressure steam cleaned and scrubbed with stiff brooms to ensure that they are free of oil and grease and waste residue. Cleaning solutions will be collected in a tank truck for disposal at an approved facility.

8. Any areas of the facility that cannot be adequately cleaned using the procedure described in Item 6 will be sand blasted, hydro-blasted, or shot-blasted. The type of method used in the step will be evaluated based on Health and Safety concerns and the Sampling Plan. Any debris generated by these procedures will be placed in a DOT or UN chemically compatible container for disposal in accordance with the facility WAP.

9. After clean-up, the building surfaces will be visually inspected to assure complete removal of surface residuals. An independent laboratory will be utilized to perform portable VOC analysis.

10. Post sampling will be conducted according to the Sampling Plan to verify that decontamination is complete.

11. Safety plans will be developed for facility closure predicated on their applicability.

12. All facilities will be inspected by a PE to certify closure.

G-10 CLOSURE OF TANKS

No tanks are used for the storage of hazardous waste at the LES facility. Consequently, tank closure is not applicable. However, a tank is kept for emergency spill containment purposes. Closure of this tank is addressed in Section G-8.7 of the Plan.

G-11 AMENDMENT TO CLOSURE PLAN

An Officer of the Corporation is responsible for maintaining and updating the Plan. The Plan is kept as the LES Administrative Office and a copy is on file at DEP. The Plan will be amended whenever changes in facility operation or design affect closure. When LES requests a license modification to authorize a change in operating plans or facility design, a request for a modification of the Plan will be made at the same time.

If a license modification is not needed to authorize a change in the operating plans or facility design, the request for modification of the Plan shall be made within 60 days after such change in plans or design occurs. A copy of this amendment shall be sent to the DEP and shall not become part of the Plan until approved in writing by the Department.

G-12 CLOSURE CERTIFICATION

A PE, who will ultimately certify closure, will evaluate various stages of the closure process to verify that closure obligations are being properly met. Closure will not be considered complete until the PE certifies that the facility has been closed in accordance with the approved plan.

G-13. CLOSURE COST ESTIMATE

A summary of costs to close the LES facility is provided in Table G-2. The closure cost estimate of **$644,881.00** (2001 dollars) covers the costs associated with the removal of waste inventory, decontamination of the facility structures and equipment, disposal of wash agents, sampling and analysis, closure certification and a 10% contingency.

This closure cost estimate equals or exceeds the cost of closure at the point in the facility's operating life when the extent and manner of the operation would make closure the most expensive as indicated by the Plan. While the facility is able and the DEP permit does allow a maximum inventory of 3,636 containers (200,000 gallons), the operators of LES will, under normal operating conditions, hold the working inventory at less than 3,000 containers.

Detailed costs for transportation and disposal of the final inventory of wastes are provided in Table G-3. Third party costs are used in this estimate. These costs are calculated in November 2001 dollars. This cost estimate has been certified by an independent PE in Appendix G-III.

The closure cost estimate will be revised annually to account for inflation in accordance with 310 CMR 30.903(3) and as necessary to reflect a change in the Plan which will increase the cost of closure in accordance with 310 CMR 30.903(4). Detailed cost estimates for other closure activities are provided in Section G-13.1.

G-13.1 Facility Decontamination Costs

This section identifies costs associated with specific procedures that will be used to decontaminate the LES facility. Roman numerals associated with each item listed below correspond to those used in the cost summary provided in Table G-2.

I. Detailed costs for transportation and disposal in 2001 dollars for the final inventory of wastes are provided in Table G-3.

II. Remove and dispose of contaminated equipment, debris, tank residues, sandblasting debris and sampling devices.

*	Maximum 2 rolloffs @ $8,000 each (*freight included*)	$ 16,000

III. Clean equipment and forklifts, and wash storage area with approximately 13,000 gallons of detergent and water and three containers of wipes. Costs include labor pertaining to the collection and cleaning as well as transportation and disposal of dirty rinse water.

*	13,000 gallons @$1.00/gal	$13,000
*	Three containers cleaning wipes @$325	$ 975
*	Labor: 160 man-hours @ $35/hr.	$ 5,600
*	PPE/equipment/tools 4 people/5 days @ $35/day	$ 700
*	PPE disposal, one container	$ 325
	Total	$20,600

IV. Based upon decontamination of the storage tank, bulking area, dike walls, container handling area, and the truck loading pad as well as walls, support posts and beams, as much as 11,000 additional gallons of contaminated water and detergent solutions will be generated.

*	11,000 gallons @ $1.00/gal	$11,000
*	Labor: 160 man hours @ $35/hr.	$ 5,600
*	PPE/equipment/tools 4 people/5 days @ $35/day	$ 700
*	Rental of steam cleaners and power washers plus misc. decontamination supplies: 20 days @$200/day	$ 4,000
*	Water storage container rental/misc. drums	$ 350
*	PPE disposal, one container	$ 325
	Total	$21,975

VI. Container loading labor and forklift costs:

A. Labor:

2 Forklift operators: 720 man-hours @ $18.00/hr	$ 12,960
1 Warehouse Supervisor: 360 man-hours @ $25.00/hr	$ 9,000

B. Forklift Lease:

2 Forklifts - 18 weeks @ $125.00/week		$ 4,500
	Total	$ 26,460

VII. Sample and Analysis Program:

A. Pre-Sampling:

30 wipe samples @ $200.00 each	$ 6,000
6 grab samples @ $300.00 each	$ 1,800

B. Post Sampling:

30 wipe samples @ $200.00 each	$ 6,000
6 grab samples @ $300.00 each	$ 1,800

C. Labor:

Sampling, report preparation and review: 122 hours @ $25.00/hr		$ 3,050
	Total	$ 18,650

VIII. Certification by Registered Engineer:

36 hours @ $100.00/hour		$ 3,600
	Total	$ 3,600

FIGURE G-1 SCHEDULE OF CLOSURE

Time (*days*)

Activity	0	30	60	90	120	150	180
1. Final Acceptance of Waste							
2. Inventory Removed Off-site							
a. Sampling	---------->						
b. Analysis	---------->						
c. Removal	---------->						
d. Facility Decontamination	---------->						
4. Closure Completed	---------->						
5. Closure Certified	---------->						
6. Full Closure Notification	---------->						

Activity Completed

TABLE G-1 MAXIMUM WASTE INVENTORY BY SPECIFIC WASTE GROUPINGS

	Waste Type	Waste Volume, 55-Gallon Containers	Shipping Method	Disposal Method
A.	Halogenated oils, solvent sludge (semi-solid)	500	Containers	Incineration
B.	Halogenated oils, solvent sludge (liquid)	400	Bulk	Incineration
C.	Non-halogenated solvents, sludges (semi-solid)	250	Containers	Incineration
D.	Non-halogenated solvents, high heat value, low chlorine (liquid)	356	Bulk	Incineration
E.	Treatable or Organic Solids	370	Containers	Secure landfill
F.	Aqueous Organic (liquid)	300	Bulk	Incineration
G.	Acids (liquids)	300	Containers	Aqueous treatment
H.	Aqueous alkaline (liquid)	300	Containers/ Bulk	Aqueous treatment
I.	Oxidizers (liquid)	100	Containers	Aqueous treatment
J.	Organic Sludges (semi-solid/solid)	210	Containers	Secure Landfill
K.	Aqueous wastes w/toxic metals	200	Containers	Aqueous treatment
L.	Recyclable Chlorinated solvents	100	Containers	Recycling
M.	Non-recyclable chlorinated solvents	100	Containers	Incineration
N.	Non-chlorinated recyclable solvents	50	Containers	Recycling
O.	Recyclable Lightbulbs	100	Containers	Recycling

MAXIMUM WASTE INVENTORY 3,636 Containers (200,000 gallons)

TABLE G-2 SUMMARY OF COSTS TO CLOSE FACILITY

Item		Cost in November 2000 Dollars
I	Transport/dispose waste inventory	$ 478,970
II	Transport/dispose contaminated equipment	$ 16,000
III	Wash equipment and container storage areas; dispose contaminated waste water and wipes	$ 20,600
IV.	Flush storage tank, handling, loading area; dispose of contaminated waste water	$ 21,975
V.	Container loading labor & forklift costs	$ 26,460
VI.	Sample & analysis program	$ 18,650
VII.	Certification by registered professional engineer	$ 3,600
Subtotal		**$ 586,255**
10% Contingency		$ 58,626
2001 TOTAL CLOSURE COST		**$644,881**

TABLE G-3 CLOSURE COST ESTIMATE FOR DISPOSAL OF WASTE INVENTORY

	Waste Type	Maximum Inventory[b]	Cost Per Container[c]	Total Cost (*dollars*)
A.	Halogenated oils, solvent sludge for (semi-solid) incineration.	500	260	130,000
B.	Halogenated oils, solvent for incineration (liquid).	400	115	46,000
C.	Non-halogenated solvents/ sludges	250	105	26,250
D.	Non-halogenated solvents, High heat value, low chlorine	356	60	21,360
E.	Treatable or Organic solids	370	160	59,200
F.	Aqueous Organics	300	60	18,000
G.	Acids (liquid)	300	125	37,500
H.	Aqueous alkaline (liquid)	300	125	37,500
I.	Oxidizer liquids	100	165	16,500
J.	Organic Sludges:	210	105	22,050
K.	Aqueous-waste w/toxic metals	200	125	25,000

TABLE G-3 (continued)

	Waste Type	Maximum Inventory[b]	Cost Per Container[c]	Total Cost (*dollars*)
L.	Recyclable Chlorinated Solvents	100	170	17,000
M.	Non-recyclable chlorinated solvents	100	170	17,000
N.	Non-chlorinated recyclable solvents	50	35	1,750
O.	Recyclable Light bulbs	100	28	2,800
P.	Non-reusable empty containers for disposal.	80	11	880
Q.	Non-reusable, disposable empty 5-gallon containers.	60	3	180
	Total	**3,636[a]**	**$**	**478,970**

[a] *Not including items P and Q.*
[b] *Anticipated maximum inventory.*
[c] *Cost including disposal and freight.*

G-14 FINANCIAL ASSURANCE MECHANISM

LES has satisfied the requirements of financial assurance for closure by obtaining a closure insurance policy that conforms to 310 CMR 30.904(5). The wording of the insurance certificate is identical to the wording specified in 310 CMR 30.909 (5).

Appendix G-I provides a copy of the LES Closure Insurance Certificate. Appendix G-II provides engineering certification of Closure Plan and Closure Cost Estimate. Signed originals have been provided to DEP in accordance with 310 CMR 30.904(1).

G-15 REGISTERED PROFESSIONAL ENGINEER CERTIFICATION

A registered professional engineer has certified that the Closure Plan and Closure Cost Estimate are consistent with current procedures and costs, and meet the requirements of Massachusetts DEP 310 CMR 30.000 and U.S. EPA 40 CFR Part 264. See Appendix G-II for engineering evaluation and certification.